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09/909,638	07/20/2001	J. Michael Ramsey	1875-ESID-1401-X-CON-1	2113

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EXAMINER

BARTON, JEFFREY THOMAS

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/909,638

Applicant(s)

RAMSEY, J. MICHAEL

Examiner

Jeffrey T. Barton

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-5 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 2-5 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. The amendment filed on 2 February 2005 does not place the application in condition for allowance.
2. The affidavit under 37 CFR 1.132 filed 2 February 2005 is insufficient to overcome the rejection of claims 2-4 based upon Jacobson et al [*Anal. Chem.* 66,1107-1113. (1994)] as set forth in the last Office action because the affidavit is unsigned. Examiner notes Applicant's intention to file a signed copy of the affidavit, which would overcome the rejections based on the Jacobson et al reference.

***Status of Rejections Pending Since the Office Action of 29 October 2004***

3. All rejections of claim 1 are withdrawn due to cancellation of the claim.
4. The rejection of claims 2-4 under 35 U.S.C. §102(b) as anticipated by Pentoney et al is withdrawn due to Applicant's amendment.
5. The rejection of Claims 2-5 under 35 U.S.C. §102(a) as anticipated by Jacobson et al is maintained.
6. The rejection of claims 2-5 under 35 U.S.C. §103(a) as obvious over Moring in view of Pentoney et al is withdrawn due to Applicant's amendment.
7. The rejections of claims 2-5 under the judicially created doctrine of obviousness-type double patenting are withdrawn due to Applicant's submission of the terminal disclaimer filed 2 February 2005.

***Terminal Disclaimer***

8. The terminal disclaimer filed on 2 February 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US Patents 6,001,229 and 6,342,142 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Claim Rejections - 35 USC § 102***

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 2-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Jacobson et al.

Regarding claim 2, Jacobson et al disclose a method of controlling movement in a microscale channel, comprising: flowing a first fluid material through a first microchannel portion; and constricting the flow of this fluid by concomitantly introducing additional fluid into the first channel portion from two other microchannel portions that connect to opposite sides of the first microchannel by applied voltage (Figure 3b, Results and Discussion section, 1<sup>st</sup> paragraph)

Regarding claim 3, Jacobson et al disclose the channel portions meeting at a cross intersection, and the first fluid being pinched at the intersection. (Figure 3b, Results and Discussion section, 1<sup>st</sup> paragraph)

Regarding claim 4, Jacobson et al disclose electrokinetic flow of the first fluid.  
(Results and Discussion section, 1<sup>st</sup> paragraph)

Regarding claim 5, Jacobson et al disclose imaging the material following the constricting step. (Figure 3b is such an image)

This rejection from the prior action is maintained until the submission of a signed affidavit sufficient to overcome the rejection.

### ***Claim Rejections - 35 USC § 103***

11. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pentoney et al in view of Harrison et al.

Regarding claim 2, Pentoney et al disclose a method of controlling movement in a microscale channel, comprising: flowing a first fluid material through a first microchannel portion (Electroosmotic flow, see Results and Discussion section; Microchannel dimensions for all capillaries disclosed in Figure 2); and constricting the flow of this fluid by concomitantly introducing additional fluid into the first channel portion from two other microchannel portions that connect to opposite sides of the first microchannel (Results and discussion section, 1<sup>st</sup> and 3<sup>rd</sup> paragraphs; Raising the reagent reservoirs above the buffer reservoirs will inherently cause flow from both side channels into the main channel which guides the electroosmotic flow)

Regarding claim 3, Pentoney et al disclose all channel portions meeting at a cross intersection. (Figures 2, 3) Pinching of the first fluid would result, given the flow pattern discussed above.

Regarding claim 4, Pentoney et al disclose electroosmotic flow of the first fluid.  
(Results and Discussion section, 2<sup>nd</sup> paragraph)

Pentoney et al do not explicitly disclose causing fluid flow from the second and third microchannel portions by applied voltage.

Harrison et al teach the advantages of using electroosmosis to cause fluid flow within small capillaries. (e.g. page 895, paragraph bridging 1<sup>st</sup> and 2<sup>nd</sup> columns)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Pentoney et al by using electroosmosis to cause fluid flow through the side channels from reagent reservoirs (3) to the central channel, because Harrison et al teach the advantages of electroosmosis for causing bulk fluid flow in capillaries, including the ability to eliminate moving parts. (Page 895, 2<sup>nd</sup> column) A skilled artisan would have been motivated to modify the system of Pentoney et al by including means for causing electroosmosis in the side channels because it would eliminate the need to physically raise and lower the reservoirs (3) to adjust fluid flow.

12. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moring et al in view of Pentoney et al and Harrison et al.

Regarding claim 2, Moring discloses a method of controlling fluid flow in microscale channels, comprising: flowing a first fluid through a first microchannel portion (Figure 6, capillaries 513 and 514; Column 5, lines 5-8); and constricting the flow by concomitantly flowing additional fluid into the first channel portion from one of two

additional channel portions connected to opposite sides of the first channel portion.  
(Figures 6 and 8; Column 6, lines 55-68)

In addition, Moring discloses the additional capillary being present for flexibility of operation (Column 7, lines 1-3), and the possibility of plural reagents being introduced.  
(Column 3, lines 39-43)

Regarding claim 3, Moring discloses the channels being connected at a cross intersection (Figure 6). Pinching of the first fluid at the confluence of flows would inevitably occur.

Regarding claim 4, Moring discloses the first fluid being flowed electrokinetically.  
(Column 3, lines 60-68; Column 5, lines 5-8)

Regarding claim 5, Moring discloses imaging the first fluid material after the constricting step. (Column 4, lines 27-39; Column 9, lines 53-55)

Moring does not explicitly disclose flow into the first channel section through the second side channel concomitant with the flow through the first side channel. He also does not disclose using an applied voltage to cause fluid flow through the side channels  
(Figure 6, 519 and 520)

Pentoney et al disclose a capillary electrophoresis method including simultaneous confluent flow through two side channels into a flow within the central channel. (Results and Discussion Section, 1<sup>st</sup> - 3<sup>rd</sup> paragraphs)

Harrison et al teach the advantages of using electroosmosis to cause fluid flow within small capillaries. (e.g. page 895, paragraph bridging 1<sup>st</sup> and 2<sup>nd</sup> columns)

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Moring by introducing additional reagents to the reactor by providing flow through both side channels of the cross intersection, as taught by Pentoney et al, because Moring discloses such flexibility of operation and the possible requirement of additional reagents.

It would also have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Moring by using electroosmosis to cause fluid flow through the side channels from the reservoirs (Figure 6, 68 and 69) to the central channel, because Harrison et al teach the advantages of electroosmosis for causing bulk fluid flow in capillaries. (i.e. convenience, mitigation of high back pressure effects, reliability; Page 895, paragraph bridging 1<sup>st</sup> and 2<sup>nd</sup> columns)

### ***Response to Arguments***

13. Applicant's arguments, see pages 4-6 and 7, filed 2 February 2005, with respect to the rejection(s) of claim(s) 2-4 under 35 U.S.C. 102(b) as anticipated by Pentoney et al and claims 2-5 under 35 U.S.C. 103(a) as obvious over Moring in view of Pentoney et al have been fully considered and are persuasive (except as noted below). Therefore, the rejections have been withdrawn. However, upon further consideration, new grounds of rejection are made based on these references in view of Harrison et al.

Applicant's argument that Moring cannot be combined with Pentoney et al in the manner proposed by the Examiner (Amendment, paragraph bridging pages 7 and 8) is not persuasive. Applicant points to one embodiment discussed by Moring, in which



reservoir 69 is used as a waste reservoir (Moring, Column 7, lines 7 and 8), arguing that the modification proposed by the Examiner is not needed within Moring's system and that it would actually destroy it. On the contrary, the paragraph from which Applicant excerpted the waste reservoir use of reservoir 69 (Column 7, lines 1-14) clearly is intended to disclose flexibility in using additional capillaries connected to the reactor for either supply or waste, not rigidly defining any particular capillary or reservoir as being used for waste or supply. This is indicated by the open language used by Moring - "Additional capillaries . . . provide additional flexibility for this electrophoretic apparatus" and "For example" at Column 7, lines 1-4. Moring discusses plural additional buffers or reagents to be applied to the system, and a waste reservoir is already disclosed at 64. Based on this disclosure, a skilled artisan would have envisioned plural capillaries (e.g. 519 and 520) for introducing buffers or reagents to the central capillary, particularly in view of the teaching of Pentoney et al.

### ***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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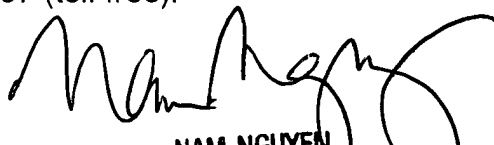
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey Barton, whose telephone number is (571) 272-1307. The examiner can normally be reached Monday-Friday from 8:30 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached at (571) 272-1342. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

JTB  
March 23, 2005

  
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